CLAIMS

1. Method for producing microchips by using immersion lithography, characterised in that the immersion fluid comprises an additive so that the refractive index of the immersion fluid is higher than the refractive index of the fluid not comprising the additive.
2. Method for producing microchips according to claim 1, characterised in that the refractive index of the immersion fluid is at least 1% higher.
3. Method according to claim 1 or 2, characterised in that the additive is soluble in the immersion fluid.
4. Method according to claim 3, characterized in that the immersion fluid comprises 1 - 70 wt.% of the soluble additive.
5. Method according to claim 1 or 2, characterised in that the additive is insoluble in the immersion fluid.
6. Method according to claim 5, characterised in that the immersion fluid comprises as the insoluble additive nano particles.
7. Method according to claim 6, characterised that the nano particles have an average size that is 10 times smaller than the wavelength of the exposure light.
8. Method according to claim 6, characterised that the nano particles have an average size of less than 100 nm.
9. Method according to any of claims 6-8, characterised in that the fluid comprises at least 10 volume % of the nano particles.
10. Method according to any of claims 6-9, chracterised in that the particles are used of a material that has a transmission of at least 50%, as measured over a theoretical light path of 1 mm.
11. Method according to claim 10, characterised in that nano particles comprising an Al 3+-compound are used.
12. Method according to claim 10, characterised that nano particles of fused amorphous SiO_2, MgO, nanodiamond, $MgAl_2O_4$ or nano particles comprising a mixture of fused amorphous SiO_2 and Al_2O_3 are used.
13. Method according to any one of claims 1-6, characterized in that the fluid comprises transparent particles having a refractive index higher than the refractive index of the pure fluid and the additive in an amount, such that

the refractive index of the fluid comprising the additive is equal to the refractive index of the transparent particles.

14. Method according to claim 13, characterised in that the transparent particles have an average size of 1 1000 microns.

15. Method according to any of claims 13 and 14, characterised in that the transparent particles are of transparent crystals of SiO_2, Al_2O_3, MgO or HfO_2.

16. Method according to any of claims 1 -15, characterised in that the method comprises the steps of

a) transporting the immersion fluid after being used in the production of a microchip to a cleaning unit,

b) cleaning the immersion fluid

c) recycling the cleaned immersion fluid into the process for producing the chips.

17. Apparatus for producing microchips, based on the technology of immersion lithography, characterised in that the apparatus comprises the immersion fluid as used in the process of any one of claims 1-15.